

In the Claims

Please cancel Claim 10.

Please amend the following claims:

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1. (Amended) A radiation detector comprising:
 an infrared radiation sensor [thermopile]; and
 a unitary structure of high thermal conductivity material [can] enclosing the sensor [thermopile] in a low conductivity environment and in close thermal contact with the sensor, [the can having a unitary structure of high thermal conductivity material,] the unitary thermal structure [can] comprising a tube [an elongated radiation guide] of a first internal diameter extending from an opening [viewing window] to a rear volume of larger internal diameter in which the sensor [thermopile] is mounted, the unitary thermal [can] structure having an outer surface with an outer diameter at its end adjacent to the opening [window] which is less than an outer diameter about the rear volume, the outer surface of the unitary thermal structure being tapered about the tube [radiation guide] such that a unitary thermal mass of increasing outer diameter is provided about [the end of] the tube [radiation guide adjacent to the rear volume].
 2. (Amended) A radiation detector as claimed in Claim 1 further comprising an additional thermal mass surrounding the rear volume and a portion of the unitary thermal mass and in close thermal contact with the unitary thermal [can] structure.

3. (Amended) A radiation detector as claimed in Claim 1 wherein the tube [can] provides a narrow field of view from the sensor [thermopile] of about sixty degrees or less.
4. (Amended) A radiation detector as claimed in Claim 1 further comprising a window of transparent material mounted to the unitary thermal structure adjacent to an end of the tube [wherein the window is a lens].
5. (Amended) A radiation detector as claimed in Claim 1 wherein the length of the tube [radiation guide] and the field of view through the tube [radiation guide] and the field of view through the tube [radiation guide] from the sensor [thermopile] are such that the sensor [thermopile] only views an ear canal within less than about 1.0 [1.5] centimeter[s] of a tympanic membrane.
6. (Amended) A tympanic temperature [sensor] detector comprising:
a radiation sensor; [thermopile; and]
a can enclosing the [thermopile] radiation sensor in a low conductivity environment, the can comprising a tube [an elongated radiation guide] extended from an opening [viewing window] to a rear volume in which the radiation sensor [thermopile] is mounted, the tube [radiation guide] providing a field of view from the radiation sensor [thermopile] of about sixty degrees or less; and
wherein an outer thermal RC time constant for thermal conduction through a thermal barrier to the can is at least two orders of magnitude greater

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than an inner thermal RC time constant for the temperature response of a radiation sensor reference junction to heat transferred to the can through the thermal barrier.

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7. (Amended) A [tympanic] temperature sensor as claimed in Claim 6 further comprising a [wherein the] window of transparent material mounted to the unitary thermal structure adjacent an end of the tube [is a lens].
8. (Amended) A tympanic temperature sensor as claimed in Claim 6 wherein the length of the [radiation guide] tube and the field of view through the tube [radiation guide] from the [thermopile] are such that the thermopile only views an ear canal within about 1.5 centimeters of a tympanic membrane.
9. (Amended) A tympanic temperature sensor as claimed in Claim 6 wherein the length of the radiation guide and the field of view through the tube [radiation guide] from the thermopile are such that the thermopile only views an ear canal within about 1.0 centimeter of a tympanic membrane.

Please add the following claims:

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11. A temperature detector comprising:
a housing adapted to be held by hand;
an extension from the housing adapted to be inserted into an ear, the detector supporting a radiation sensor which receives radiation passing into the extension from a target area in the ear;
a temperature display on the housing for displaying temperature; and

battery powered electronics in the housing for converting radiation sensed by the sensor to temperature displayed by the display, the electronics including a processor for providing an inner body temperature displayed on the housing as a function of the received radiation, indicating target temperature, compensated by an indication of ambient temperature to provide an inner body temperature approximation.

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12. A temperature detector as claimed in claim 11 wherein the inner body temperature is core temperature.

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13. A radiation detector comprising:

P/ a radiation sensor mounted to view a target of biological surface tissue;

P/ a temperature sensor for sensing ambient temperature;

P/ an electronic circuit coupled to the radiation sensor and temperature sensor and responsive to a signal from the radiation sensor and the temperature sensed by the temperature sensor to provide an indication of an internal temperature adjusted for the ambient temperature to which the surface tissue is exposed; and

P/ an output for providing an indication of the internal temperature.

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14. A radiation detector as claimed in claim 13 wherein the output is a display.

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15. A radiation detector as claimed in Claim 13 wherein the biological surface tissue includes a tympanic membrane and the display provides an indication of core temperature.

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16. A radiation detector comprising:
an extension adapted to be inserted into an ear;
an infrared radiation sensor for receiving radiation from an external target;
a thermally conductive tube for passing radiation from the external target to the sensor, the tube extending from the distal end of the extension to a rear volume of the detector in which the sensor is mounted, the tube providing a field of view from the sensor of about sixty degrees or less.

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17. A tympanic temperature detector as claimed in Claim 16 further comprising a window of transparent material mounted adjacent to an end of the tube.

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18. A radiation detector as claimed in Claim 17 wherein the window is a lens.

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19. A radiation detector as claimed in Claim 16 wherein the tube comprises a reflective inner surface.

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20. A radiation detector as claimed in Claim 16 wherein the length of the radiation tube and the field of view through the radiation tube from the sensor are such that the sensor only views an ear canal within less than about 1.0 centimeter of a tympanic membrane.

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